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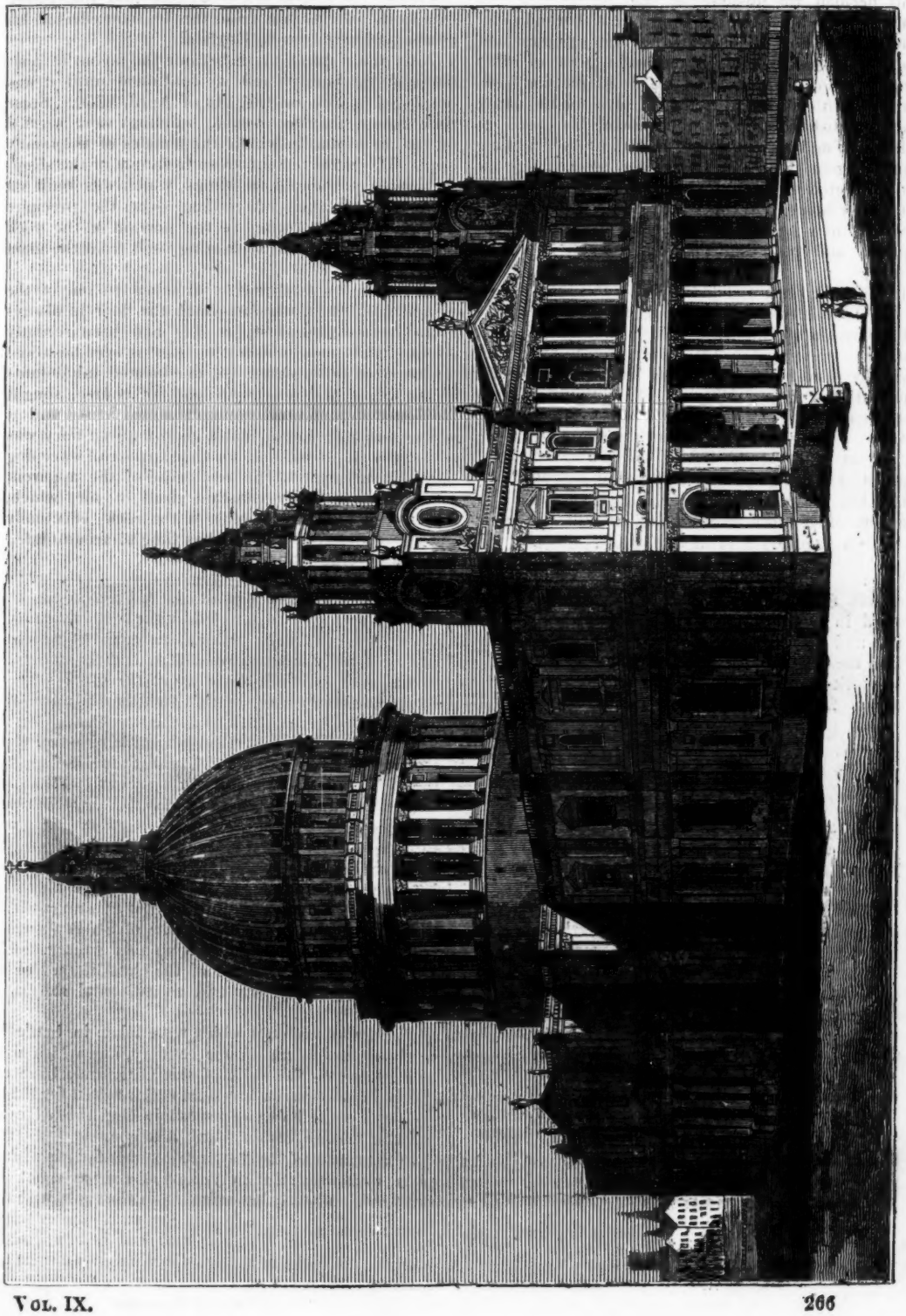
UNDER THE DIRECTION OF THE COMMITTEE OF GENERAL LITERATURE AND EDUCATION APPOINTED BY THE SOCIETY FOR PROMOTING CHRISTIAN KNOWLEDGE.



WEST FRONT OF ST. PAUL'S CATHEDRAL.

ST. PAUL'S CATHEDRAL.

THESE temples of His grace,
How beautiful they stand!
The honours of our native place,
And bulwarks of our land.

WE have given some account, in former numbers of the *Saturday Magazine*, of the ancient Cathedral of St. Paul*, and of the dreadful Fire†, which, in the year 1666, consumed this and eighty-eight other churches in the city of London. Not many years previous to its destruction by fire, that is, in the time of the Commonwealth, the old Cathedral had been the scene of shameful sacrilege; "being made," says Dugdale, "during the whole time of the late usurpation, a *horse-quarter* for soldiers; the stately portico, with beautiful Corinthian pillars, being converted into shops for semstresses and other trades, with lofts and stairs ascending thereto."

To this desecration Dryden alludes in an admired stanza of his *Annus Mirabilis*; speaking of St. Paul's;—

The daring flames peep'd in, and saw from far
The awful beauties of the sacred choir;
But since it was profaned by civil war
Heaven thought it fit to have it purged by fire.

Between the end of the usurpation and the fire, many repairs had been performed in the fabric, to which King Charles the Second contributed one thousand pounds, the same sum which he subsequently gave yearly towards the rebuilding.

We shall now speak of St. Paul's after the fire. A portion of the church being much wanted for Divine Service, two whole years, including the latter part of 1666, were spent in digging up the melted lead, clearing the rubbish, taking down the remainder of the vaulted roof, removing the floors, sorting and carrying away the stone, &c.; a part of the ruined walls being left standing, and intended for use. But this remnant of the edifice proving insufficient to support the requisite weight, a royal command was issued in 1668 for taking it down and raising "a faire and decent fabric" near or upon the former site. After the difficult and expensive task of removing the old work even to the foundation had been finished, on the 21st of June, 1675, the first stone of the present Cathedral was laid at the south-east corner of the choir by Mr. T. Strong, builder; Dr. H. Compton being bishop of London, and Sir Christopher Wren the architect and surveyor-general of the works. These three persons lived to witness the completion of the fabric in 1710‡.

It deserves to be told, to Wren's honour, that during the whole of this period he not only never got, but never coveted, any addition to his salary, originally fixed at £200 a year; always preferring, as he did, the public service to any private interest. Indeed, one of the traits truly described in the noble and affecting epitaph to his memory over the entrance to the Choir is, that HE LIVED NOT FOR HIMSELF BUT THE PUBLIC GOOD. Respecting the merits of this extraordinary person, we have, among other testimonies, that of the judicious and amiable Evelyn, who, in noticing the performances of some of the leading Italian architects of his time, observes, "I am persuaded that all this is not yet by far so much as that miracle of our age and country, Dr. Christopher Wren, were able to perform, if he were so disposed and so encouraged; because he is possessed of so many admirable advantages beyond them."

Without attempting anything like a full description of the Cathedral, we shall now furnish a general outline.

It is always difficult to obtain an authentic statement of the dimensions of so spacious and lofty a fabric, but the following is probably correct.

	Feet
Length from east to west within the walls	500
Breadth of the nave and aisles	107
Breadth through the transepts	285
Length of the choir	165
Height from ground to the top of the cross	356
Circumference of the dome	420

The ground-plot is upwards of two acres and sixteen perches.

Over the iron gates of the Choir is a fine organ, richly ornamented with carved work. The Choir has thirty stalls of carved oak on each side, besides the throne on the south side for the Bishop of London, and that on the north for the Lord Mayor. The reading-desk, within its railed enclosure, is in the form of an eagle, brass gilt, whose expanded wings support the book. The altar-piece is ornamented with blue fluted pillars, veined with gold like *lapis lazuli*, the capitals being also gilt.

In the south-west transept is a staircase leading to the top; the number of steps from the floor to the famous Whispering Gallery being 280; to the Golden Gallery 534; and to the Ball 616. The chief objects of interest to the stranger on ascending this staircase, will be here shortly stated in their order. *The Library*, which is said to contain many literary treasures; and the floor of which curiously inlaid, without nail or peg, consists of 2376 pieces of wood. A *Geometrical Staircase* of ninety steps, supported by the bottom step. *The Great Bell* in a turret above, the weight of which is 11,474lbs., the diameter ten feet, and thickness ten inches, and on which the hour of *the Clock* strikes; the quarters striking on two smaller bells beneath. Those who view this clock from the street below, would hardly imagine that its minute-hand is nine feet eight inches long, the hour-hand five feet nine inches, and the circumference of the face fifty-seven feet!

The next wonder is the *Whispering Gallery*, which conveys the slightest sound with increased clearness and force to another person on the opposite side of the gallery, "though," says our little guide-book, "the distance between them is no less than 140 feet!" We may here mention Sir James Thornhill's eight paintings within the Dome, illustrative of the life of St. Paul, which appear to great advantage from this gallery. The view, also, of the interior of the church, on looking down upon the pillars and monumental statues is extremely grand.

The various colours which were taken in battle by the brave defenders of our country, and which used to wave within the walls of this Cathedral, have recently been removed to places better suited for them: the naval flags being deposited in Greenwich Hospital, and the military in that of Chelsea.

In the centre of the chequered marble floor is a brass plate, round which the divisions of the pavement are arranged. Exactly beneath this, in the vault, within a square stone, below a handsome sarcophagus which was brought from Windsor, and had been originally intended to hold the body of Cardinal Wolsey, lie the remains of NELSON.

* See *Saturday Magazine*, Vol. I., p. 234.
The dimensions of the old cathedral, as taken in 1309, were these:—

Length	690 feet
Breadth	120 do.
Height of east part	188 do.
——— Tower	260 do.
——— Wooden Spire	272 do.
Making height of whole steeple	534 do.

The whole space occupied by the church was upwards of two acres and a half.

† See *Saturday Magazine*, Vol. II., p. 106.

‡ The church of St. Peter, at Rome, with which St. Paul's has been compared, is a very much larger building, took 135 years to complete, during the reigns of nineteen popes, and passed through the hands of twelve architects.

We must pass over the other tombs and monuments, with the exception of two possessing uncommon interest; namely, WREN'S, whose plain grave-stone in the crypt of the Cathedral is the more impressive from its having, as an inscription, only his name and age, which was ninety-one, and the date of his death (1723): and a white marble monumental group of great beauty by Chantrey, at the east end of the south aisle, representing the pious and earnest HEBER in his last ministerial act of confirming native Christians in India.

In the crypt, under the present choir, was formerly a parish church, called St. Faith's, some small remains of which, having escaped the great fire, are still visible. In the vaults are interred, waiting the great day of resurrection, the bodies of many persons eminent in their day, in the various walks of life.

We cannot quit the interior of this noble Cathedral without adverting to a glorious scene which, by God's blessing, is yearly witnessed within its walls*. How many of our readers have been themselves present at the ANNIVERSARY MEETING OF THE CHARITY SCHOOLS, listening to the chorus of praise ascending from thousands of young voices, and have felt the attachment to their faith and their church strengthened, and their Christian charity increased. May this assemblage continue for untold successive years, undiminished and unimpaired!

A short distance before the great western door, is placed a statue of Queen Anne, in whose reign it was executed by Francis Bird. On the base, at her feet, are allegorical female figures, of Britain, France, Ireland, and America. This statue was repaired about twelve years since, having been twice mutilated by the violence of lunatics, the one in 1743, the other, a Lascar, in 1769. The iron railing, together with the stone enclosing the building, cost 11,202*l.* 0*s.* 2*d.*!

The whole expense of the fabric amounted to 747,954*l.* 2*s.* 9*d.* This sum was raised partly by voluntary donations and subscriptions; and partly by a duty on coals, which was levied from time to time during the work, in behalf of this, as well as of other city churches then in progress. A list of the contributors to St. Paul's was found among Sir W. Dugdale's papers in Warwickshire, after his death. It was subsequently much enlarged, and forms an illustrious memorial of British piety and charity. We quote a few, as specimens of the munificence, as well as general character of that subscription, all classes assisting in rearing a goodly temple to God's honour; and thence we leave our readers to infer how much ought to be done NOW, not grudgingly but cheerfully, to answer the call so justly made for means to build and endow additional churches in the metropolis. Among the numerous contributions, upwards of a century and a half ago, when what is called the value of money was far greater than at present, we find the following;—

Dr. Juxon, Archbishop of Canterbury . . .	£1000
Dr. Gilbert Sheldon, ditto. . . .	2000
E. Swift, jun., Esq., of Lincoln's Inn . . .	1000
Dr. Stern, Archbishop of York	1850
Dr. Morley, Bishop of Winchester	1818
Dame Dionys Williamson, of Hales Hall, Norfolk	2620
Ralph Snow, servant to Gilbert, late Lord Archbishop of Canterbury	100
Tobias Rustat, Yeoman of the Robes to the King	100
Mr. John Johnson, jeweller, London . . .	50
In lieu of gloves† and consecration dinner, several sums, each of	100

* The first sermon preached for the assembled Charity Schools, was in St. Andrew's, Holborn, in 1702. In the following year, and so successively to 1737 inclusive, the Anniversary Sermon was preached at St. Sepulchre's; from 1738 to between 1780 and 1790, at Christ-Church, Newgate-Street, and since that time in the Cathedral Church of St. Paul.

† It was anciently a custom upon the consecration of bishops for them to make, to all persons who came to their consecration-dinners, presents of gloves; an item, which in those days amounted to a large sum of money. King Charles the Second gave the following order, that "each Lord Bishop before his consecration should pay £50 towards the rebuilding of the cathedral church of St. Paul's; which, as it is a pious work, so will it be some ease to the respective bishops, in regard the expense of gloves did usually far exceed that sum."

‡ He was clerk of the works, and published an account of the Cathedral.

There were also not a few anonymous donations; for example, from "A concealed gentlewoman," "An unknown person," &c.; instances similar to which,—of "the left hand not knowing what the right hand doeth,"—are seen in the Metropolis Church subscription-list, recently put forth; namely,

A clergyman seeking for treasure in heaven . . £5000
Exhort one another lest any of you be hardened . £1090

With reference to the building of St. Paul's, but with an application to the present times, we have ascertained that public bodies, companies, dioceses, colleges, came forward to assist on that occasion with great liberality. There is an original document now before us, which shows not only that parishes transmitted their several aggregate collections, but that the officers of the church also contributed as individuals, and that the plan of subscribing certain sums by four equal yearly instalments, suggested by the Bishop of London in his "Proposals," p. 10, was then adopted.

In the ancient MS. book of collections in the parish of St. Olave's, Hart-street, London, the following entry occurs in the year 1680.

Collected, since y^e^ 4 day of Aprill, 1680, towards y^e^ rebuilding of y^e^ Cathedrall Church of St. Paul, London, y^e^ some of sixty-two pounds, nine shillings, and one penny. £Lxii. 9*s.* 1*d.*

More subscribed by Daniel Milles, rector of this pīsh, ffoure pounds per annum, for ffoure years.

And by James Hadley, pīsh clearke of this pīsh, twenty shillings per ann. for foure years.

Memorandu. Y^e^ afforesaid some of £62 9*s.* 1*d.*, was on y^e^ 12 day of July, 1680, pd by y^e^ order and direcons of my Ld Bpp of Lond., unto Mr. John Tillison‡ who gave his acquittance for y^e^ same on y^e^ duplicate of y^e^ acco^t^.

We have already taken occasion in the pages of the *Saturday Magazine*, to call our readers' attention to the Bishop's appeal, and are glad of the opportunity afforded by the topic of this paper to recur to one of the most important subjects that can engross the regard of a Christian people. It is difficult to conceive how the portion of an income can be expended more to the credit of the donors, or the benefit of their neighbours, than in a good work like this. And if we rightly estimate the blessing of knowing that divine Saviour after whom we are called, and for the extension of whose Kingdom upon earth we constantly pray, no duty can be more bounden upon us than to lend our aid towards enabling others, the poor especially, to do Him holy service, and to hear his word preached in the pure and protestant church to which we belong. M.

THERE are few days in which something does not occur to make us feel that life is a state of trial.—DANBY.

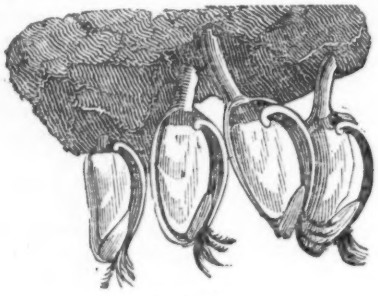
THERE are many hours in every person's life which are not spent in anything important; but it is necessary that they should not be passed idly.—LORD COLLINGWOOD.

HOME.—We are born at home, we live at home, and we must die at home; so that the comfort and economy of home are of more deep heartfelt, and personal interest to us, than the public affairs of all the nations in the world. —?

THE SMOOTH BARNACLE,

(Anatifa lævis.)

THE curious popular error, that the Barnacle contained the young of a species of goose, which was thence called the Barnacle Goose, has lasted for many ages, and still prevails among the uneducated, on the shores of all the European seas. One reason of the continuance of this error in several Roman Catholic countries, is the permission granted by the priest to its members, to eat this goose on fish-days, because it is considered, on account of its supposed watery origin, to partake more of the character of a fish than a fowl. To show the extent to which an erroneous belief may be carried, we may quote the following notice sent by Sir Robert Moray to the Royal Society, and *printed* by them in their *Transactions*. He says, "The pedicle seems to draw and convey the matter which serves for the growth and vegetation of the



Anatifa lævis.

shell and the little bird within it." "In every shell that I opened, I found a perfect *sea-fowl;* the little bill like that of a *goose*, the eyes marked; the head, neck, breast, wings, tail, and feet formed; the feathers everywhere perfectly shaped, and blackish coloured; and the *feet* like those of other water-fowl, to my best remembrance." "Nor did I ever see any of the little birds alive, nor met with anybody that did; only some credible persons have assured me that they have seen some as big their fist!!"

A curious anecdote respecting Barnacles occurs in the *Memoirs of Lady Fanshawe*, who, when in France, in 1649, met the learned Sir Kenelm Digby, famous for his conversational powers, and for his talent of *romancing*.

When we came to Calais, (says her ladyship,) we met the Earl of Strafford and Sir Kenelm Digby, with some others of our countrymen. We were all feasted at the governor's of the castle, and much excellent discourse passed; but, as was reason, most share was Sir Kenelm Digby's, who had enlarged somewhat more in extraordinary stories, than might be averred, and all of them passed with great applause and wonder of the French then at table; but the concluding one was, that Barnacles, a bird in Jersey, was first a shell-fish to appearance, and from that, sticking upon old wood, became in time a bird. After some consideration, they unanimously burst out into laughter, believing it altogether false; and, to say the truth, it was the only thing true he had discoursed with them. That was his infirmity, though otherwise a person of most excellent parts, and a very fine-bred gentleman.—*Memoirs*, p. 72.

Mr. Thomson describes his discovery of their real nature in these words:—

On April 28, 1823, which the author had devoted to the investigation of some marine productions, he was returning home without any addition to the stock of knowledge, when casually throwing out a small muslin towing-net, on crossing the ferry at Passage; such a capture of marine animals was made, as furnished a treat, which few can ever expect to meet, and could hardly be excelled for the variety, rarity, and interesting nature of the animals taken.

After mentioning the names of several very rare species, he continues,—

and others perfectly nondescript, and incapable of being associated in any of our classifications of the crustacea: of this description is the little animal about to be described.

THE ACORN-SHELL BARNACLE, (*Balanus.*)

There is a small translucent animal one-tenth of an inch long, of a somewhat elliptic form, moderately compressed, and of a brownish hue. When in a state of perfect repose, it resembles a very minute muscle, and lies upon one of its sides at the bottom of the vessel of sea-water in which it is placed. At this time all the members of the animal are withdrawn within the shell, which appears to be composed of two valves, united by a hinge along the upper part of the back, and capable of opening from one end to the other along the front, to give occasional exit to the legs. The limbs are of two descriptions; namely, in front a large and very strong pair, provided with a cup-like sucker and hooks, &c., and at the hinder part of the body, six pair of swimming-members, so articulated as to act in concert, and to give a very forcible stroke to the water, so as to cause the animal, when swimming, to advance by a succession of bounds, after the manner of the water-flea.

The greatest peculiarity, however, in the structure of this animal, is the eyes; which, although constantly shielded by the valves of the shell, are placed on foot-stalks, as in the crab and lobster, in front at the sides of the body.

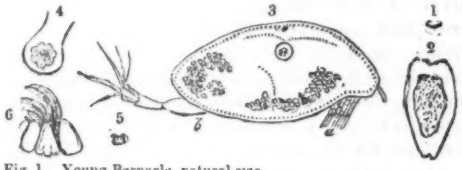


Fig. 1. Young Barnacle, natural size.
2. ——— magnified, seen from above.
3. ——— highly magnified, seen from side; *a* swimming-members, *b* front limb with sucker.
4. Eye much magnified.
5. Perfect Young Barnacle, natural size.
6. ——— full grown.

Some of these curious creatures were collected in the Spring of 1826; and in order to see what changes they might undergo, were kept in a glass vessel, covered by such a depth of sea-water, that they could be examined at any time by means of a common magnifying glass; they were taken on May the 1st, and on the night of the 8th, the author had the satisfaction to find that two of them had thrown off their *exuviæ*, and, wonderful to say, were firmly adhering to the bottom of the vessel, and changed into young Barnacles! such as are usually seen intermixed with grown specimens, on rocks and stones, at this season of the year. The eyes were still perceptible, although the principal part of the black colouring-matter appeared to have been thrown off by the *exuviæ*. On the 10th, another individual was seen *in the act of throwing off its shell*, and attaching itself like the others, to the bottom of the glass.

[From the *Book of Shells.*]

IN order to the right conduct of our lives, we must remember that we are not born to please ourselves. He that studies simply his own satisfaction, will always find the proper business of his station too hard or too easy for him. But if we bear continually in mind, our relation to the Father of Being, by whom we are placed in the world, and who has allotted us the part which we are to bear in the general system of life, we shall easily be persuaded to resign our own inclinations to *unerring Wisdom*, and do the work decreed for us with cheerfulness and diligence.—*Adventurer.*

ON BREAD,

AND THE VARIOUS ARTICLES USED IN MAKING IT.

BREAD, a generic term, applied figuratively to the food of man, and literally to food prepared from wheat, rye, oats, barley, pease, beans, rice, maize, &c., and also from chestnuts, from several roots, and from the fruit, pith, and other parts of some of the palms and bananas.

It would be absurd to attempt to enter minutely into the early history of an article of such primary necessity as bread. But it would be as absurd to exhibit man (with some writers) as using bread-corn first by parching the grains, then as inventing methods of bruising or grinding it, and making unleavened bread, and lastly, by some lucky accident, discovering the process of leavening or fermenting the dough, and arriving at the luxury of loaf-bread. Agriculture and bread-making are so intimately connected, that it is difficult to conceive of the use of, at least, unfermented bread as being later than the tillage of the earth. The earliest mention of the distinction between unleavened and leavened bread in the Bible is on the departure of the Israelites from Egypt, which has led some to infer that the discovery belongs to that country. "The art of feeding mankind on so small a grain as wheat," says Dr. Darwin (approvingly quoted by Dr. Paris), "seems to have been discovered in Egypt by the immortal name of Ceres:" but these writers appear to forget that the destination of man at a very early period of the history of the world was, "In the sweat of thy face shalt thou eat bread." The cakes which the wife of Abraham prepared for the angelic visiters to the patriarch were unleavened: but unleavened bread is still made in the East, after an interval of four thousand years, with the same celerity, and much after the same fashion, so that no inference can be drawn as to the use of leaven being *unknown* at that period. It is stated also, that the art of making bread has advanced to its present state progressively, and is indebted to the labour of many generations for its perfection: but it is rather remarkable what little improvement there has been in the art; in the East it has still all its primitive character, and in Europe the improvements which have been made in it belong to comparatively recent years.

In the early history of every country the making of bread is a household business, and belongs exclusively to females. With the progress of society, and the growth of cities, it would become a profession, or trade. Mention is made in the book of Jeremiah, of the "bakers' street;" but whether this was a district where the inhabitants of Jerusalem might purchase bread, or was an appendage to the royal household, or a special arrangement under the then siege of the city by the Babylonians, is not certain. Pliny says, that bakers were unknown in Rome for the space of 850 years after the foundation of the city, until the Persian war. The first public bakers of the imperial city were Greeks. In England, under the feudal system, the tenants of a manor were not only obliged to pay for grinding at their lord's mill, but also to bake their bread at his oven. Customary ovens were common in corporate towns. In the year 1290, the corporation of Newcastle complained to parliament that the Prior of Tynemouth baked bread at North Shields which ought to have been baked at the corporation oven.

Pennant gives an engraving of a hand-mill used in Scotland, which resembles the hand-mills of the East; and Dr. Ledwich, in quoting from Giraldus Cambrensis, the mention which he makes of the mills of St. Lucherin and St. Fechin, considers them as solitary instances of their kind erected by the monks and states that "querns" or grinding-stones, were generally used, and seem to have been sufficient for the agriculture of Ireland to a late period. But there is unquestionable evidence of the existence of water-mills, and of the cultivation of corn, at an early period of Irish history.

The bread of the Jews was made generally of wheat or barley, or lentiles and beans. Bread of wheat-flour, as being the most excellent, was preferred; barley-bread being used only in times of scarcity and distress. The corn was, and still is, in the East, ground by females at a hand-mill, generally in the morning, as much being ground as would make bread for the day. After the corn was ground, the bread was baked. The Jews, not using much animal food, came to regard bread as the symbol of all food or nourishment; and the practice of making just what would be sufficient for each day, gives a beautiful force and propriety to the petition in the Lord's Prayer, "Give us this day our daily bread." The Romans, in the luxurious days of the empire, affected great delicacy and refinement in the making of bread. So late as the sixteenth century, wheaten bread, in our own country, was a luxury reserved exclusively for the rich, the bread which was eaten by the labourer being of the coarsest kind. Moryson, who wrote in Elizabeth's time, remarks that the English husbandman ate barley and rye brown bread, and preferred it to white bread, as abiding longer in the stomach, but citizens and gentlemen eat pure wheat bread. "Of brown bread," says Harrison, "there are two sorts, one baked as it cometh from the mill, so that neither the bran nor the flour are any whit diminished; the other hath little or no flour left therein at all, and it is not only the worst and weakest of all the sorts, but also appointed in old time for servants, slaves, and inferior kind of people to feed on." The common bread-corn of the people in the time of Charles the First was barley.

Bread is either unleavened or leavened. Unleavened bread is simply a mixture of meal and water, formed into a firm and tough cake. It contains all the component parts of the flour but little altered. The oatmeal cakes eaten in Scotland and in the north of England, and in Norway, Sweden, &c., are unleavened. "The ancient Britons eat broad thin cakes," says Giraldus Cambrensis, "which were baked from day to day." Moryson tells us that the Scotch border troopers, on their expeditions, carried each a bag of meal, and a thin iron plate or *girdle*, with which, on kindling a fire, they could bake oaten cakes to quench the cravings of hunger. An iron plate, termed a *girdle*, is still an appendage, or part of the household furniture, of every cottage of the North, for the purpose of baking oatmeal cakes. Travellers in the East describe the process, which is not uncommon, of baking bread on a plate of sheet-iron, though the more common method is to bake in a pit or excavation in the centre of the floor.

Leavened bread may be divided into two sorts,—that which is fermented with sour dough or leaven, and that which is fermented with barm or yeast. Leaven is obtained by mixing flour and water, and leaving it to stand till it ferments. The bread baked from leaven alone is too sour to be eaten; but if a small piece of sour dough is well kneaded with a quantity of fresh dough, it causes the entire mass speedily to ferment,—hence the meaning of the Scriptural phrase, "a little leaven leaveneth the whole lump." The effect of this fermentation is to render the whole mass more digestible and light, when

baked. The dough is swelled, or raised, becomes spongy, or full of cavities; the baking checks the fermentation, and produces some important change, which is not clearly understood, and the produce is loaf-bread. The use of barm or yeast, instead of leaven, to excite fermentation in the dough, was an important improvement. Yeast is the foam or heading which collects on the surface of beer during fermentation. It is not ascertained when it was first applied to the baking of bread, but it is stated to have been known to the ancient Gauls. The Parisian bakers have the credit of bringing it into modern use; it would appear that the faculty of medicine at Paris, in the year 1688, gravely denounced its use as prejudicial to the health of the people.

Yeast produces a much more speedy and effectual fermentation than leaven, and makes in every respect a better bread. Where leaven is employed, the bread is apt to be sour, in consequence of the difficulty of adjusting its proportion to the fresh dough; if too much leaven is used, it gives an unpleasant flavour; if too little, the bread is compact and heavy.

"It was long," says Dr. Paris, "before the bakers could convince the public that bread baked with *barm* was superior to that of *leaven*. A great question arose among chemists, as to the nature of this *barm*, that could produce such effects, and elaborate analyses were made, and theories deduced from their results; but all these ingenious speculations fell to the ground, when it was found that *barm* dried, and made into balls would answer every purpose: the bakers imported it in such a form from Picardy and Flanders, and when again moistened, it fermented bread as well as the recent substance. The presence, therefore, of carbonic acid, acetic acid, and alcohol, could not be essential, for these ingredients were separated by the process of its preparation. At length it was discovered that gluten, mixed with a vegetable acid, produced all the desired effects; and such is the nature of leaven, and such is the compound to which barm is indebted for its value as a panary ferment. After the dough has sufficiently fermented, and is properly raised, it is put into the oven, previously heated, and allowed to remain till it is baked. The mean heat, as ascertained by Mr. Tillet, is 448°. When the bread is removed, it will be found to have lost about one-fifth of its weight, owing to the evaporation of water; but this proportion will be varied by the occurrence of numerous circumstances, which it is not easy to appreciate. Newly-baked bread has a peculiar odour as well as taste, which are lost by keeping; this shows that some peculiar substance must have been formed during the operation, the nature of which is not understood. Bread differs very completely from the flour of which it is made, for none of the ingredients of the latter can be discovered in it; it is much more miscible with water than dough; and on this circumstance its good qualities, most probably, in a great measure depend. It is not easy to explain the chemical changes which have taken place. It appears certain, that a quantity of water, or its elements, is consolidated and combined with the flour; the gluten, too, would seem to form a union with the starch and water, and thus to give rise to a compound, upon which the nutritive qualities of bread depend."—Dr. PARIS *on Diet.*

The majority of the bakers in London at present prepare their own yeast, which they make with hops and malt.

The finest and best bread is made from wheat. This is owing to the quantity of gluten which it contains, the average quantity in wheat-flour amounting to about one-fifth of the whole weight of the meal. Gluten, which appears to possess many of the properties of animal matter, performs an important part in the chemical changes which take place in the transition made from flour into bread. In all ages, therefore, wheat-bread has been preferred, and with reason, to bread made from other grain, as being more nutritive, wholesome, and of easier digestion. Oats make a pleasanter bread than either barley or rye: barley-bread has a sweetish taste, is heavy, viscid, and flatulent; and bread made from rye is acescent and purgative. Oatmeal-bread is charged with causing heartburn in those who are unaccustomed to it, and occasioning cutaneous affections in those who make use of it. The first charge is in all likelihood correct, for barley or rye-bread will also create an unpleasant sensation in those not used to it; but the second charge is ridiculous. Oats must be extremely nutritive, and justify Lord Elibank's gloss on Dr. Johnson's definition, "Where will you find finer horses or finer men."

Bread has been made from turnips and from potatoes, but potato-flour requires a quantity of wheat-flour mixed with it. The London bakers commonly mix a quantity of potatoes, mashed up, with their wheat-flour, in making wheaten bread: the proportion is about fifteen pounds of potatoes to eight bushels of wheat-flour. Rice, which, in the east, serves many of the important uses that wheat and the potato do with us, makes a very good bread, but, like the potato, it requires the addition of some flour. Maize, which, according to Humboldt, is cultivated in America, from forty-five degrees north latitude to seventy-two degrees south, may be termed the bread-corn of a large extent of that continent. Bread made from pease, the use of which is somewhat common in the northern parts of Great Britain, is disagreeable from the gas which it generates in the intestines. The chestnut is supposed to be the acorn of ancient history and tradition, and which used to be so frequently almost the only support of the common people in time of famine. It may be made into bread, although it is heavy and indigestible. Sago-bread is used in the Moluccas, made from the pith of the sago-tree. It would be tedious to enumerate the various substances which might be made into bread, of greater or lesser nutritive power; even saw-dust, sifted and prepared, will make bread, not only capable of being eaten, but capable of nourishing the human body. In fact, it would appear, that, with the aids of science, the probabilities of a famine recurring, with all its horrors, are diminished almost to Zero.

Though baking is comparatively a simple process, much depends on the skill and judgment of the baker in making a good loaf. He must be careful to attend both to temperature and to time. The manipulation is varied according to judgment, experience, or whim; but most commonly the following is the mode pursued in making a wheaten loaf:—a quantity of potatoes (where potatoes are used,) are beat up in a tub, water, yeast, and a handful of flour are added, and all are stirred together. This is set aside for eight hours, for the first rising or fermentation. Water and flour are then added, and the mass is stirred briskly to bring it to a consistence. This is then set, at a proper heat according to the weather, to rise, and this part of the process is technically termed, *setting the sponge*, from the spongy appearance of the mass. The sponge stands for six hours, during which time it rises and falls twice. An additional quantity of flour and water, and a certain quantity of water and salt*, are added to the sponge, which is now mixed or broken up by the hand into a thin consistence; flour is added to work the mass into dough, the dough is left in the trough for two hours, taken out for baking, divided into portions according to the size wanted, and, the oven being previously heated, baked for two hours. Of course, in this process, everything must be carefully proportioned according to the quantity of bread which it is intended to make.

* The French bakers do not put so much salt into their bread as the English bakers do—in fact, French bread is insipid to an English palate, while the Frenchman shrinks with a shrug of his shoulders from the quantity of salt which is commonly used by the English.

The different kinds of bread commonly used in England may be divided into white, wheaten, and household. White bread is made with wheat-flour, carefully sifted; wheaten bread of flour and the finer kind of bran; and household of the entire grain, containing all the flour and all the bran. From the preference which is invariably given to white bread, bakers not unfrequently mix alum with the inferior flour, in order to bring it as near as possible to the favourite colour; and it is also stated, that without alum the loaves will stick together in the oven, and not separate from each other with that smooth surface which is so much desired. Whatever mischief may be done to the human stomach by this use of alum, must be left to the physician to determine; it certainly has an astringent effect; but so also has bread made with the finest sifted flour, from the quantity of starch which it contains, uncounteracted. Bad flour may be made into tolerable bread by adding, to each pound, from twenty to forty grains of the common carbonate of magnesia. But the habitual use of flour so corrected by magnesia, would have a pernicious effect on the stomach. Much of the wholesomeness and digestibility of even the best bread made from the finest flour, depends on the salt which is added. Nearly a pound of salt is added to each bushel of flour. Some bakers give five pounds of salt to eight bushels of wheat-flour.

It belongs strictly to a manual of cookery to give a list and description of the various kinds of bread which ingenuity, taste, or fancy, may create. Of the immense number of vegetables which exist, there are comparatively few which can be converted into bread: but chemistry may yet add to the number, and an extended knowledge of the physiology of man may better adapt those in use to the nourishment and powers of digestion of the human body.

[From Edlin *on Bread-making*; Accum, *on Bread-making*, is compiled from Edlin. Eden's *State of the Poor*; Paxton's *Illustrations of Scripture*; Dr. Paris *on Diet*.]

Religion supposes us men engaged in society obliged to carry on the affairs of life, but in such a manner that they may promote and advance the important business of our eternal salvation, so that, as the practice of it is consistent with trade and with conversation, with business and diversion, so it ought to mix with all those ordinary actions of life, and govern them after such a manner, that whilst we pass through things temporal, we may not lose things eternal; for "what does the Lord thy God require of thee, but to do justice, to love mercy, and walk humbly with thy God."—Nelson.

Our fellow-creatures can only judge what we *are* by what we *do;* but in the eye of our Maker what we *do* is of no worth, except as it flows from what we *are*. Though the fig-tree should produce no visible fruit, yet if the living sap is in it, and if it has struggled to put forth buds and blossoms which have been prevented from maturing by inevitable contingencies of tempests or untimely frosts, the virtuous sap will be accounted as fruit: and the curse of barrenness will light on many a tree, from the boughs of which hundreds have been satisfied, because the Omniscient Judge knows that the fruits were threaded to the boughs artificially, by the outward working of base fear and selfish hopes, and were neither nourished by the love of God or of man, nor grew out of the graces engrafted on the stock by religion.—Coleridge.

Love my memory, cherish my friends, their faith to me may assure you they are honest. But above all, govern your will and affection by the word and will of your Creator, in me beholding the end of this world with all her vanities. —*Last Words of Sir Philip Sydney.*

My mother, active, cheerful, and constantly occupied in domestic affairs, sought pleasure nowhere, and found happiness and content everywhere. —Mrs. Grant.

THE VOYAGE OF LIFE.

The analogy between a voyage and man's life has been frequently and beautifully noticed. The principal moral of these allegorical allusions centres in the uncertainty of everything in this life, and that from the examples of the vessel's getting safe into port, after being exposed to the most imminent danger of sinking, we should learn not to give up hope in adversity; but, invoking the Divine aid, use our best endeavours to meliorate our condition: on the other hand, that in a prosperous state of things, we should not be too confident because we seem to have a favourable gale, a placid sea, and the sun shining upon us; for, like the vessels which, after leaving port with all these advantages, have been overtaken by the tempest, and perished in the storm, the advantages of birth, fortune, friends, and abilities, may all prove insufficient. You may fail in the most desirable and commendable pursuits in life, while others, wanting at their outset all these advantages, may finally attain the object of their pursuits: the one failing, perhaps, through that negligence which arises from too much confidence at the advantages they possess; the other succeeding, through that diligence and circumspection, which the consciousness of the want of every other advantage naturally inspires.

Remember, therefore, this advice: Never let the advantages with which you may begin life's voyage, lull you into confidence and negligence; nor the want of them depress your minds into hopelessness and inactivity: but, humble and moderate in prosperity, and firm and patient in adversity, persevere in that path which reason and justice point out, and then despair not of reaching your desired port.—Hamlain.

The whole world may be divided into these three ranks and orders of men: those who, having found God, resign themselves up to His service; those who, having not yet found Him, do indefatigably search after Him; and lastly, those who have neither found Him, or are inclined to seek Him. The first are happy and wise; the third are unhappy and fools; the second must be owned to be wise, as they own themselves to be unhappy.—Pascal.

Money is not the only thing that is not "our" own;—time, and thought, and knowledge, and power, moral influence, and spiritual advantage,—all must be answered for, for all are God's.—*The Listener.*

A certain degree of self-respect is one of the best securities against moral degradation.—Dr. Davy.

The gratification of the love of knowledge is delightful to every refined mind; but a much higher motive is offered for indulging in it, when that knowledge is felt to be practical power, and when that power may be applied to lessen the miseries or increase the comforts of our fellow-creatures. —Dr. Davy.

The purest motive of human action is the love of God. He who is influenced by that, feels its influence in all parts of duty, upon every occasion of action; throughout the whole course of conduct.—Paley.

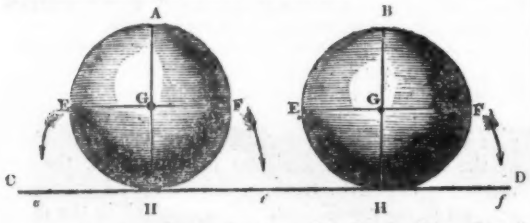
To be of no church, is dangerous. Religion, of which the rewards are distant, and which is animated only by faith and hope, will glide by degrees out of the mind, unless it be invigorated and re-impressed by external ordinances, by stated calls to worship, and the salutary influence of example —Johnson's *Life of Milton.*

Habits of seriousness of thought and action are necessary to the duties, to the importance, and to the dignity of human life. What is amiable gaiety at twenty-four, might run the risk, if it was unaccompanied by other things, of being thought frivolous and puerile at forty-four.—Sir James Mackintosh.

POPULAR ERRORS. No. IV.

"Perpetual motion will be the result of laying a perfect sphere upon a perfect plane surface."

THIS IS very generally believed among mechanics, and yet a very cursory examination of the laws of motion would prove, that the more perfect the sphere, and the more level the plane, the less chance there would be of any motion whatever.



Suppose A and B to be two globular bodies, placed on the plane C D. Let A be a perfect sphere, and consequently, having its centre of gravity exactly in the centre of its substance; in this case, instead of perpetual motion being produced, as the believers in fiction would say, a state of rest would be the result. If motion is to be the consequence, in what direction is that motion to begin? in the direction F *f* or E *e*? Neither of these cases could occur; for E and F are at the same distance from G, the centre of gravity; and, consequently, would balance each other. Motion could not, therefore, take place in either of these directions. If we pursue our inquiries further, we shall find that by choosing any two points opposite to each other on the sphere, they will always bear the same relation to the centre of gravity as E and F did, and the consequences would be the same. Or, in other words, if a line is drawn from the summit A to the base H, placing the sphere in any direction, the portions of the sphere on each side the line will always be equal, and balance each other. If, on the other hand, the globular figure were not perfect, as at fig. B, in some cases a limited motion would be produced merely by the force of gravity; for, if the portion, B F H was larger than B E H, the globe would move in the direction F *f*, until E and F balanced each other; that is, until a line drawn perpendicularly upwards from H, should divide the object B into two equal portions.

The efforts which have been made to discover the perpetual motion, by employing the mechanical powers, although they always have (as they always must) produced loss and disappointment to the projectors, have still been of service to mankind, from having been the cause of discovering many new combinations of mechanical power, in the same manner as the vain efforts of the alchymist rendered service to the science of chemistry.

IT is said to be "*unlucky to go under a ladder*," and so, in one sense of the word, it really is; a ladder being seldom reared against a house, except workmen are employed on the building.

"*IT is unlucky to spill the salt;*" this superstition most likely comes from the East, where, even at the present day, if a traveller enters the tent of an Arab, and partakes of salt with his host, he may consider himself not only secure from insult, but certain of the future services and protection of the inhabitant of the desert. The spilling of the salt, therefore, would indicate an unfriendly feeling, and in that case it would be "unlucky to spill the salt."

The means employed in the cure of diseases, have been from time immemorial fertile sources of error; for in this case, the fear of death, and the antipathy to pain, were both arrayed on the side of the natural credulity of ignorance, and assisted in leading mankind astray. In former times, no means were too absurd, no medicament too filthy, to be considered capable of restoring health. There were spells and charms in abundance to prevent or cure disease; some merely childish; others, particularly in Roman Catholic countries, absolutely impious. Most of these notions have been dissipated by the advance of knowledge, but too many still remain, as a proof of the weakness of our nature.

Sometimes this credulity has been turned to good account by skilful men. A Turkish physician being once called on to prescribe for a young nobleman, whose ill health was occasioned by inactivity, produced two heavy metallic balls, as large as it was possible for the hand to grasp. These balls were rolled up in linen, and covered with strange characters. The physician assured his patient that they possessed powerful medicinal properties, but that their virtue could only be excited by the patient's taking one in each hand, and moving his arms about, until a profuse perspiration came on: then, he assured him, the virtues contained in the balls would produce a beneficial effect. The young man obeyed these directions, and, of course, was cured of his disease merely by exercise.

FEAR has been supposed, at times, to produce great effects upon disorders that were considered incurable; and a disgusting practice, founded on this idea, maintained its ground till within a few years. We allude to the supposed cure of a wen by rubbing it with the hand of a man who had been just executed. This offensive superstition was frequently practised at the Old Bailey, when executions were more frequent than at present, until it was altogether forbidden by the sheriffs.

BUGS appear to have been favourite ingredients in the medicaments of ancient doctors. They were prescribed in wine for colic, and an ancient writer says, "Truly it is a remedy to be despised; but it is no new remedy, and it is a certain cure; it once helped a governor of Zürich, so that he had like to have written a commendation in favour of them."

THE following are noticed as cures for the bite of a scorpion:—"four grains of mummy*, with butter and cows'-milk—house-mice cut asunder—lark's heel—a broiled scorpion." But these ridiculous notions of attaining an object by simple means, were not confined to medicine alone: a book was published which promised a short road to learning. Erasmus, speaking of this book, says, "I have seen the book which teaches this art, but I understood nothing in it, because I had no one to explain it to me. In this book are divers figures of animals,—dragons, lions, leopards, and a number of circles, in which were painted various characters of letters in Greek, Latin, Hebrew, and other foreign languages. The title of the book promised the knowledge of these sciences in fourteen days." But he wisely concludes, that there is "no notarial nor any other method of becoming learned, but that care, love, and assiduity, alone are of service in the study of the sciences."

* See *Saturday Magazine*, Vol. IV., pp. 154, 185, 237.

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